https://doi.org/10.61698/nje.v72n1.6 © Norwegian Journal of Entomology. 10 June 2025

Five new records of oribatid mites (Acari, Sarcoptiformes, Oribatida) from the Norwegian Arctic and Subarctic

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Seniczak, A., Klütsch, C.F.C., Seniczak, S., Hagen, S.B., Selmer, F.A. & Coulson, S.J. 2025. Five new records of oribatid mites (Acari, Sarcoptiformes, Oribatida) from the Norwegian Arctic and Subarctic. *Norwegian Journal of Entomology* 72, 61–70.

We present five new records of soil oribatid mites, including four found in the Norwegian subarctic, in Finnmark: *Chamobates voigtsi* (Oudemans, 1902), *Hermannia nodosa* Michael, 1888, *Kunstidamaeus nidicola* (Willmann, 1936) and *Oribatella sexdentata* Berlese, 1916, and one found in Svalbard: *Scutozetes arcticus* Ermilov & Makarova, 2021. This paper presents details of these new records and comments on the known distribution and ecology of the species.

Key words: Norway, Svalbard, new records, *Chamobates*, *Hermannia*, *Kunstidamaeus*, *Oribatella*, *Scutozetes*.

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Introduction

Mites of the suborder Oribatida (order Sarcoptiformes), commonly called “moss mites” or ”beetle mites” are ubiquitous components of soils of different ecosystems, regardless of latitude, where they play the central role in decomposition processes, energy flow and nutrient cycling (Behan-Pelletier & Lindo 2022). In northern ecosystems like Svalbard, the role of mites in decomposition processes is more pronounced because, in the absence of some soil fauna groups, like earthworms, millipedes, woodlice, their roles are fulfilled by the microarthropod communities, such as oribatid mites, springtails and enchytraeid worms (Hodkinson 2013).

In Svalbard, mites are one of the most species-rich invertebrate groups, being slightly

outnumbered only by insects (Coulson *et al*. 2024a, 2024b). Oribatida of Svalbard have achieved the attention of researchers for more than 150 years, although with varying intensity over these years, and there are approximately 80 publications concerning the Oribatida from this region, and 95 species known (Seniczak & Seniczak 2020, Seniczak *et al.* 2020b, Coulson *et al.* 2024a, 2024b).

Continental Norway has received much less attention regarding oribatid mites, and only a handful of publications concern Finnmark – the second largest Norwegian county with respect to area. The first single oribatid records from northern Norway were included in the publication of Thor (1937), in which however incomparably more findings from southern parts of the country were reported. Cadwalladr (1969) studied in detail Oribatida of Olderfjord in Finnmark where he found 50 oribatid species and two taxa identified on genus level. The most extensive study of the Oribatida in Finnmark was carried out by Karppinen (1971) based on sampling from 42 locations where 74 species were found, including 24 new to Norway. In addition, Markkula (2014) carried out ecological studies in Ferdesmyra mire in eastern Finnmark where she compared three habitats (decaying palsa hummock, non-permafrost hummock, and thermokarst pool), but Markkula provided only the eight most abundant species and the rest of Oribatida were not identified to species. Recently, all the juvenile stages of some oribatid species have been described for the first time, as part of a project from the Norwegian Taxonomy Initiative to NIBIO, Svanhovd: Soils of Subarctic (SOS) (Seniczak *et al*. 2023a, 2023b, 2023c), including the undescribed *Zachvatkinibates svanhovdi* A. Seniczak & S. Seniczak, 2023.

Arctic and subarctic areas are particularly vulnerable to climatic and anthropogenic changes (Aronsson *et al.* 2021, Coulson *et al.* 2024a, 2024b) and there is a special need to understand the biodiversity of these areas. This paper aims to contribute to this, reporting from Svalbard and Finnmark five species of Oribatida mites new to Norway and summarizing their known distribution and ecology.

Methods

Site descriptions

Svalbard. The Svalbard samples were collected from the glacial valley of the Ebba River, Ebba Valley (Ebbadalen) (78.69900°N, 16.66200°E) which is located in Petunia Bay (Petuniabukta), central Spitsbergen, approximately 55 kilometers northeast of Longyearbyen (Figures 1A, 1B). The high Arctic climate of Ebbadalen is characterized by a mean annual air temperature of approximately −6.0°C, air temperatures above 0°C occur usually from May to October, and the warmest months are July and August, when the air temperature rises to a daily mean of 5–6°C. The location inside a fjord results in a slightly warmer summer and much drier climate than the southern and western parts of Spitsbergen, with annual precipitation not exceeding 200 mm (Rymer & Wachecka-Kotkowska 2024). Ebbadalen is a wide valley, about 5 km long and up to 500 m wide, running northeast and with a vegetation type at the sampling transect classified as *Dryas* heath (*Dryas octopetala*) and with an organic soil (Figure 2A). The bedrock at the site consists of marine deposit from Holocene (GeoSvalbard 2025).

Finnmark. Samples were collected at three sites (Figure 1C). Two of them were located at the Jacob's River (Grense Jakobselv) which is the outlet of Jakobselv, the river that runs along the Norwegian-Russian border and discharges into the Varanger Fjord (Varangerfjorden), a bay located in the Barents Sea. The climate in the region is oceanic continental, with a mean annual temperature of 0.1°C and a mean annual precipitation of approximately 620 mm (Bjørklund *et al*. 2015). The vegetation is northern boreal in a transition zone between oceanic and continental vegetation sections in north-eastern Finnmark (Moen 1998, Bjørklund *et al.* 2015). One sample was collected at the shore (69.78026°N, 30.82289°E), considered brackish water area, with a semi-limestone beach meadow (Figure 2B) (Elven & Johansen 1983) characterized by freshwater-affected salt weed (*Salicornia* sp.) communities (P.E. Aspholm, personal communication, November, 2022). The second sample was collected from birch forest at Grense

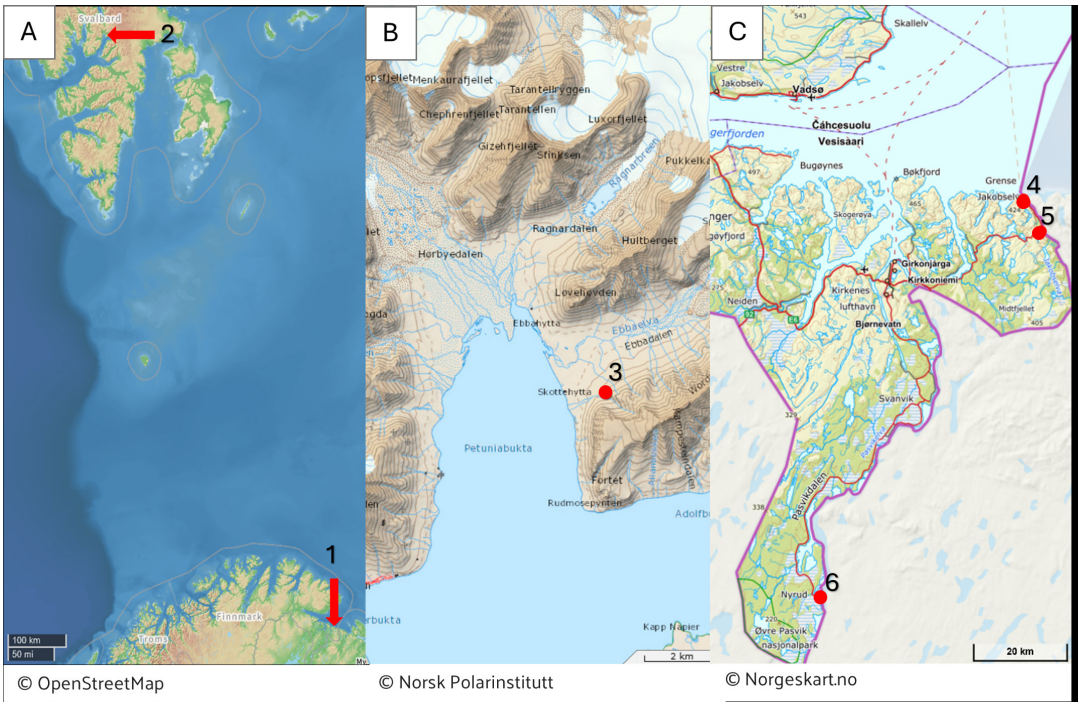

FIGURE 1. Location of the study sites. **A**. Study areas in Ebbadalen, Svalbard (1) and Sør-Varanger, Finnmark (2) (modified OpenStreetMap 2025). **B**. Ebbadalen (modified ToppoSvalbard 2025) with marked sampling site (3). **C**. Sør-Varanger (modified Norgeskart 2025) with marked sampling sites at Grense Jakobselv (4 – shore, 5 – birch forest) and Nyrud (6).

Jakobselv (69.71258°N, 30.87124°E). However, in contrast to the Nyrud sampling site (see below), the undergrowth predominantly consisted of ferns (Figure 2C).

The third site, Nyrud, is situated towards the southern tip of the Pasvik Valley (Pasvikdalen) close to the Norwegian-Russian border (69.14349°N, 29.23669°E) and belongs also to the northern boreal vegetation sections like described above. The climate in Nyrud is subarctic with cold winters and comparatively cold summers. The average annual air temperature is about 0.5°C with an average annual precipitation of 72.5 mm (Weather and Climate 2025). The sampling site can be characterized as a downy birch (*Betula pubescens*) forest with undergrowth of predominant lingonberry (*Vaccinium vitis-idaea*), but crowberry (*Empetrum nigrum*) can occur. In addition, some other herbaceous species, for example, horsetails (*Equisetum* sp.), occur as well (Figure 2D).

Sampling

Svalbard. In Svalbard 60 soil samples were collected from Ebbadalen in a northwest facing slope of the ridge on 7 July 2023 (Figure 2A). Each sample was approximately 10 cm by 10 cm and included vegetation and soil. The samples were kept cool (6°C) at the University Centre in Svalbard until being taken to the University of Inland Norway where the microarthropod fauna was extracted in Tullgren funnels into 90% ethanol for 10 days.

Finnmark. In Finnmark a total of 190 soil samples were collected during the years 2021–2023. Samples, where oribatid species new to Norway were found, were collected 25–26 August 2021, from three locations of Sør-Varanger, Finnmark: 1) Grense Jakobselv, the shore of the river (Figure 2B), 2) Grense Jakobselv, birch forest (Figure 2C), and 3) Nyrud, birch forest (Figure 2D). During the project, in 2021–2023, eight soil samples were collected from each of the three locations mentioned above.

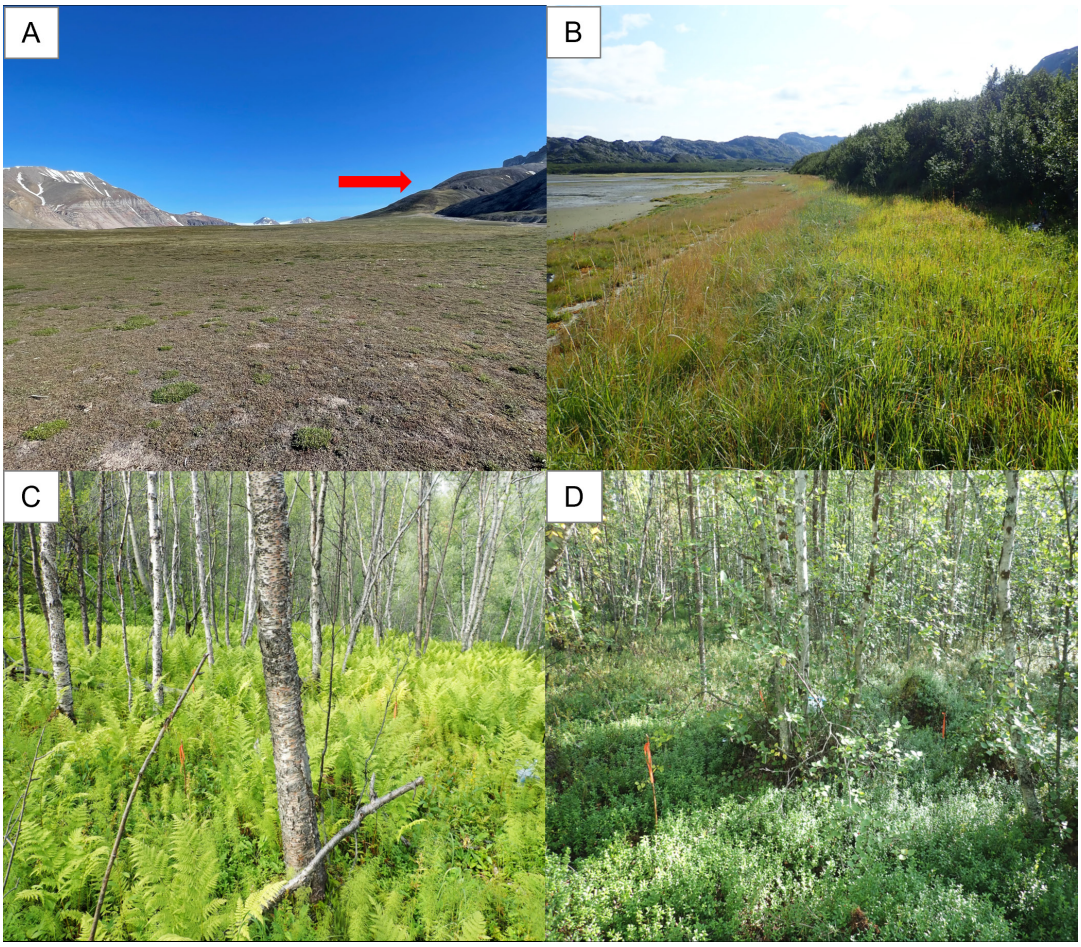

FIGURE 2. Sampling sites. **A**. Ebbadalen, Svalbard, arrow points plots where *Scutozetes arcticus* was found. **B–D**. Sør-Varanger, Finnmark (Photos: Juho Vuolteenaho, NIBIO Svanhovd). **B**. Grense Jakobselv, the shore of the river. **C**. Grense Jakobselv, the birch forest. **D**. Nyrud, the birch forest.

One collective sample was taken on the shore of Grense Jakobselv, along an away transect from the river edge (approximately 10 m long). These individual samples were combined and extracted in Berlese funnel for one week into vials with 90% ethanol. Samples collected from birch forests at Grense Jakobselv and Nyrud, were extracted in Tullgren funnels (Burkard Manufacturing Co Ltd) for one week and stored in 90% ethanol. Collectors and identifiers are abbreviated as follows: SJC = Stephen J. Coulson, AF = Arne Fjellberg, CFKC = Cornelya F.C. Klütsch, FAS = Fredrik A. Selmer, AS = Anna Seniczak, SS = Stanisław Seniczak, JV = Juho Vuolteenaho.

Identification and SEM images

Specimens were identified by AS and SS on temporary cavity slides in lactic acid, using the Nikon ECLIPSE 80i light microscope and the key of Weigmann (2006) and Ermilov & Makarova (2021). New findings to Norway are based on Mehl (1979) and later publications (Seniczak *et al*. 2019, 2020a, 2021a, 2021b, 2021c and included references). Species are deposited in 90% ethanol at the University Museum of Bergen, Norway (ZMUB).

For scanning electron microscopy (SEM) studies, the mites were air-dried and coated with Au/Pd in a Polaron SC502 sputter coater

and placed on Al-stubs with double-sided sticky carbon tape. The SEM micrographs were taken with a QUANTA FEG 450 scanning electron microscope at the University of Bergen.

Results

Chamobates voigtsi (Oudemans, 1902)

Material: **FØ,** Sør-Varanger: Grense Jakobselv, 69.71258°N, 30.87124°E, 26 August 2021, soil of birch forest, 1 specimen, Tullgren funnel extraction, leg. JV, AF & CFKC, det. AS, coll. ZMUB.

Remarks: *Chamobates* Hull, 1916 (Chamobatidae) is a medium-size genus, represented by 30 species worldwide, with Holarctic and tropical (except Australian) distribution (Subías 2004, 2024). In Norway it is represented by eight species: *C. birulai* (Kulczyński, 1902), *C. borealis* (Trägårdh, 1902), *C. cuspidatiformis* (Trägårdh, 1904), *C. cuspidatus* (Michael, 1884), *C. pusillus* (Berlese, 1895), *C. rastratus* (Hull, 1914), *C. schuetzi* (Oudemans, 1902) (Mehl 1979, Seniczak *et al.* 2019), and *C. voigtsi* (Oudemans, 1902) reported herein. *Chamobates lapidarius* (Lucas, 1849) included in the checklist of Mehl (1979) is a *species inquirenda* (Subías 2004, 2024).

Chamobates voigtsi has a Palearctic distribution (Europe: frequent, Eastern Palearctic: except Orient) (Subías 2004, 2024). In Scandinavia it is known from Finland (Niemi 1995, Niemi *et al*. 1997), Sweden (Dalenius 1950, Lundqvist 1987), and Denmark (Hammer 1972). *Chamobates voigtsi* is considered eurytopic (i.e., with broad ecological tolerance), but found mainly in acidic forest soils, particularly in coniferous (mixed) forests with conifer proportion >50%, and in moor forests (Weigmann 2006, Weigmann *et al.* 2015). It is common in soils rich in humus (Dalenius 1950). In Poland it was characteristic for the soil and litter layer under the native pedunculate oak (*Quercus robur*) but not under invasive oak (Kohyt & Skubała 2020). In the present study, it was reported from soil of a deciduous, birch forest with fern undergrowth, suggesting comparatively wet local conditions, but only one specimen was found.

Hermannia nodosa Michael, 1888

Material: **FØ,** Sør-Varanger: Grense Jakobselv, 69.78026°N, 30.82289°E, 26 August 2021, shore, 1 specimen, Berlese funnel extraction, leg. JV, AF & CFKC, det. AS, coll. ZMUB.

Remarks: *Hermannia* Nicolet, 1855 (Hermanniidae) is a large genus, with 114 species known worldwide and with a cosmopolitan distribution. In Norway, five species of this genus are known: *H. gibba* (C.L. Koch, 1839), *H. reticulata* Thörell, 1871, *H. scabra* (L. Koch, 1879), *H. subglabra* Berlese, 1910 (Mehl, 1979) and *H. nodosa* Michael, 1888 found in present study at the shore of the river Grense Jakobselv.

Hermannia nodosa has Holarctic distribution (occurs in Western Europe and Greenland) (Subías 2004, 2024) but has not yet been reported from Finland or Sweden (Lundqvist 1987, Niemi *et al*. 1997). However, it was found in a relatively nearby location of Kola Peninsula in Russia (Murman Coast and Murmansk City vicinity) (Ermilov *et al*. 2019).

The species occurs in different maritime areas and prefers humid locations with moss and algae, especially on maritime rocks and in salt marshes (Gjelstrup & Solhøy 1994, Ermilov *et al*. 2019); it was also found epilithic, in moss cushions on solid substrates, on structures such as buildings, walls, stones and rocks (Weigmann *et al.* 2015).

Kunstidamaeus nidicola (Willmann, 1936)

Material: **FØ,** Sør-Varanger: Grense Jakobselv, 69.71258°N, 30.87124°E, 26 August 2021, soil of birch forest, 1 specimen, Tullgren funnel extraction, leg. JV, AF & CFKC, det. AS, coll. ZMUB.

Remarks: *Kunstidamaeus* Miko, 2006 (Damaeidae) is a middle-size genus with 17 species and two subspecies known worldwide, all with Holarctic and Oriental distributions (Subías 2004, 2024). In Norway, the only representative of this genus is *K. nidicola* (Willmann, 1936) which has a Euroatlantic distribution (Subías 2004, 2024) and is only known from northern and central Europe (Weigmann 2006). It has been found in Sweden (Lundqvist 1987) but not from Finland (Niemi *et al*. 1997). *Kunstidamaeus nidicola* occurred in dwarf shrub tundra plots and moist tundra plots

in mountain tundra of the Lovozersky Mountains, Russia (Leonov & Rakhleeva 2020).

***Oribatella sexdentata* Berlese, 1916**

Material: **FØ,** Sør-Varanger: Nyrud, 69.14349 °N, 29.23669°E, 25 August 2021, soil of birch forest, 1 specimen, Tullgren funnel extraction, leg. JV, AF & CFKC, det. AS, coll. ZMUB.

Remarks: *Oribatella* Banks, 1895 (Oribatellidae) is a large genus with 134 species and two subspecies known worldwide, and a cosmopolitan distribution (Subías 2004, 2024). In Norway, five species of this genus are known, including *O. arctica* Thor, 1930 that occurs in Svalbard (Seniczak *et al.* 2020b), and four other species found in mainland Norway: *O. berlesei* (Michael, 1898), *O. calcarata* (C.L. Koch, 1835), *O. quadricornuta* (Michael, 1880) (Mehl 1979), and *O. sexdentata* Berlese, 1916 found in this study. The species has also been found in Finland (Niemi 1995, Niemi *et al.* 1997), but not in other Nordic countries (Lundqvist 1987).

Oribatella sexdentata has Holarctic distribution (Europe, Eastern Asia, Russia and the U.S.A.: Virginia) (Subías 2004, 2024) but is seldom found and its ecological preferences remain unknown (Weigmann *et al.* 2015). In Finland, single specimens were found in decaying aspen and in abandoned anthill of *Formica polyctena* Förster, 1850 (Niemi 1995).

***Scutozetes arcticus* Ermilov *et* Makarova, 2021**

Material: Svalbard: Ebbadalen: 78.69900°N, 16.66200°E, 7 July 2023, soil, 36 specimens, Tullgren funnel extraction, leg. AS, FS & SJC, det. AS & SS, coll. ZMUB.

Remarks: *Scutozetes* Hammer, 1952 (Tegoribatidae) is a small genus, which includes only four species known worldwide with an interesting distribution in Holarctic and in Eastern and Neotropical regions (Subías 2004, 2024). Among them, *S. lanceolatus* Hammer, 1952 has the widest, Holarctic distribution (Northern Nearctic: common, Western Palearctic: Eastern Mediterranean, and Eastern Palearctic: frequent, and Suriname), *S. ovalis* (Hammer, 1977) is known from Eastern Palearctic (Pakistan and Korea), *S. clavatosensillus* Ermilov, Martens & Tolstikov, 2013 is only known from Nepal and *S. arcticus* Ermilov *et* Makarova, 2021, is only reported from Northern Russia (Subías 2004, 2024). Here, we add its occurrence in Svalbard.

Scutozetes arcticus (Figure 3) was found in seven samples out of 60 collected – at the top and in the middle of the slope (Figure 2A) in patches dominated by mosses, *Dryas octopetala* and *Saxifraga* sp. Its average abundance was five specimens per 500 cm^3 and it varied from three to ten specimens per 500 cm^3. We have not identified the sex of the specimens collected, because most of them were used for SEM micrographs and other studies that require specimens that were only in contact with ethanol. Earlier, two females of this species were found in Mosselbukta (north Spitsbergen, established *Dryas* heaths) but were wrongly identified as *S. clavatosensillus* (Seniczak *et al*. 2017), to which *S. arcticus* is most similar to (Ermilov & Makarova 2021). Only adults (Figure 3) of this species have been found in Ebbadalen and juveniles of this genus remain unknown (Norton & Ermilov 2014, 2024) which makes its taxonomic position uncertain (Ermilov & Makarova 2021).

Discussion

Northern ecosystems are generally poorer in number of species compared to lower altitudes (e.g., Lewinsohn & Jorge 2024). However, these ecosystems include species adapted to these characteristic environments which makes them particularly interesting to study and important to protect their diversity. For example, about 30% of Oribatida mite species known from Svalbard (Seniczak & Seniczak 2020, Seniczak *et al*. 2020b, Coulson *et al*. 2024a, 2024b) do not occur in continental Norway (Mehl 1979, and later references included in Seniczak *et al.*, 2019, 2020a, 2020b, 2021a, 2021b, 2021c). *Scutozetes arcticus* reported herein for the first time from Svalbard is also an example of such an Arctic species. This species was found quite abundantly in Ebbadalen, the location where oribatid mites have not yet been studied, that confirms that more sampling in Svalbard is still needed even in

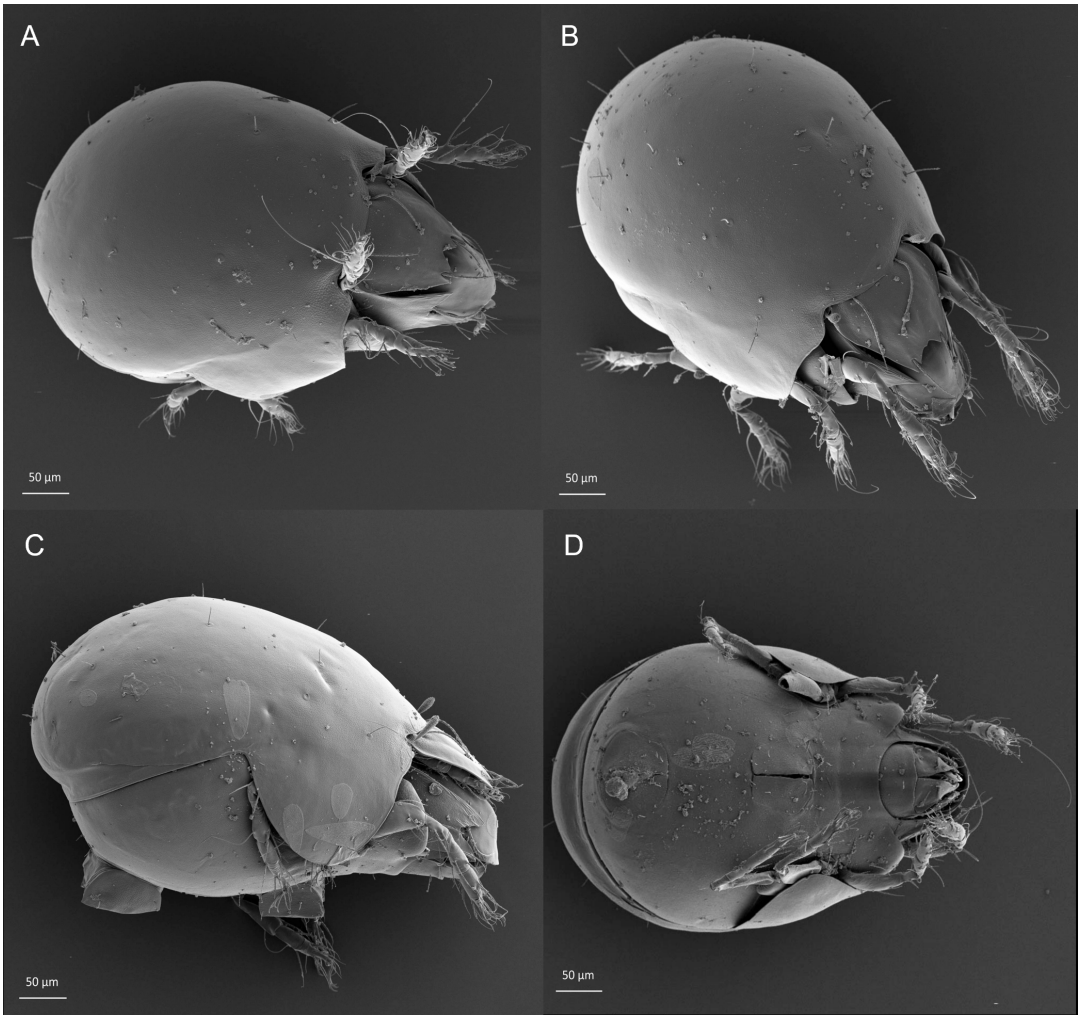

FIGURE 3. Adult *Scutozetes arcticus* found in Ebbadalen (Svalbard), SEM micrographs. **A**. Dorsal view. **B**. Dorsofrontal view. **C**. Lateral view. **D**. Ventral view.

regions that are believed to be comparatively well known compared to other regions of the Arctic (Coulson *et al*. 2024a, 2024b).

As with Svalbard, the same can also be concluded about continental Norway. Although, the knowledge of the Oribatida has increased recently due three projects from the Norwegian Taxonomy Initiative (Artsdatabanken 2025), including the current SOS project, it still remains far from being complete. All oribatid species from Finnmark reported herein as new to Norway were single findings and they have not been noted in any other samples collected during the extensive, 3-year sampling, with a total of 190 soil samples collected. This indicates that these species are rare in Finnmark. Among them only *C. voigtsi* is considered frequent in Europe (Subías 2004, 2024). For example, this species is one of the most frequently reported and numerous oribatid species in Vorarlberg state in Austria (Schatz 2020). It is also often observed in Poland (Olszanowski *et al*. 1996), Eastern Slovakia (Miko 2008) and Germany (Weigmann *et al*. 2015), but it is rare in Finland and was found only in the southern part of the country (Niemi 1995). However, in the present study, *C. voigtsi* was reported only from

birch forest with fern undergrowth, with relatively wet local conditions. In the region, around the sampling site there are numerous coniferous (mixed) forests, but this species was not found there.

As for three other species represented by single specimens in our study, *H. nodosa* was also rarely found in Germany (Weigmann *et al*. 2015), while in Iceland it was frequent and dominating in humid places with moss and algae, such as rocky shores and in salt marshes (Gjelstrup & Solhøy 1994). The finding in our study at the shore with brackish water agrees well with the ecological requirements of this species (Gjelstrup & Solhøy 1994, Ermilov *et al*. 2019). Similarly, our observation of *O. sexdentata* in birch forest is in accordance with its preference for leaf litter (Weigmann 2006). *Oribatella sexdentata* is rarely found (Weigmann *et al*. 2015) which may explain that only one specimen was found in our study. As with *K. nidicola*, it shows an ecological preference to bird nests and caves (Weigmann 2006), so possibly its occurrence in soil of birch forest studied herein was unusual. In earlier studies on Oribatida of Norway, half of the species reported new to the country (i.e., 30 species out of 60 reported) had very low abundances, i.e. represented by less than ten specimens, including 11 represented by single individuals (Seniczak *et al*. 2019, 2020a, 2020b, 2020c, 2021a, 2021b, 2021c). It is obvious that with the accumulating knowledge on the group more and more of the rare species remain to be discovered. These rare species are, however, very important to functional diversity and to the overall ecosystem function and are often more threatened by environmental changes than common species (Basile 2022).

The checklist of Mehl (1979) includes 260 oribatid species known from Norway, and after a critical review (Niedbała & Liu 2018) and with later species findings from continental Norway and Svalbard (Seniczak *et al*. 2019, 2020a, 2020b, 2020c, 2021a, 2021b, 2021c), including current study, this number exceeds 320 species, Extrapolating from knowledge of the Mesostigmata mites which are globally as rich as Oribatida (both groups are represented by about 11,000 species worldwide, Beaulieu *et al*. 2011, Schatz *et al*. 2011), and in Scandinavia are best studied in Finland where more than 437 species are known (Huhta 2016), we could expect at least 100 more oribatid species to occur in Norway, so this group still requires further study.

Acknowledgements. We express our gratitude to Arne Fjellberg, Juho Vuolteenaho (NIBIO), Marie Wingar (UNIS), for help in the collection of samples. The study was partially supported by the grant to NIBIO from the Norwegian Taxonomy Initiative (Grant No. 9-21, 70184244).

References

Aronsson, M., Heiðmarsson, S., Jóhannesdóttir, H., Barry, T., Braa, J., Burns, C.T., Coulson, S.J., Cuyler, C., Falk, K., Helgason, H., Lárusson, K.F., Lawler, J.P., Kulmala, P., MacNearney, D., Oberndorfer, E., Ravolainen, V., Schmidt, N.M., Soloviev, M., Coon, C. & Christensen, T. 2021. State of the Arctic Terrestrial Biodiversity Report. Conservation of Arctic Flora and Fauna International Secretariat, Akureyri, Iceland.

Artsdatabanken 2025. https://artsdatabanken.no/Pages/223762 (accessed January 2025).

Basile, M. 2022. Rare species disproportionally contribute to functional diversity in managed forests. *Scientific Reports* 12(1), 5897.

Beaulieu, F., Dowling, A.P.G., Klompen, H., de Moraes, G.J. & Walter, D.E. 2011. *Superorder Parasitiformes Reuter, 1909*. Pp. 123–128 in Zhang, Z.-Q. (Ed.), Animal Biodiversity: An Outline of Higher-Level Classification and Survey of Taxonomic Richness. Magnolia Press: Auckland, New Zealand.

Behan-Pelletier, V.M. & Lindo, Z. 2022. *Oribatid Mites: Biodiversity, Taxonomy and Ecology* (1st ed.). 508 pp. CRC Press, Boca Raton.

Bjørklund, P.K., Rekdal, Y. & Strand, G.-H. 2015. Arealregnskap for utmark. Arealstatistikk for Finnmark. *Ressursoversikt fra Skog og Landskap* 1, 1–97.

Cadwalladr, D.A. 1969. On the soil-inhabiting Collembola and Oribatei (Arach., Acari) of the Olderfjord Region of North Norway. *Astarte* 2(1), 7–25.

Coulson, S.J. 2013. The terrestrial invertebrate fauna of the Svalbard archipelago in a changing world: history of research and challenges. *The Canadian*

Entomologist 145(1), 131–146.

Coulson, S.J., Bartlett, J., Boström, S., Brittain, J.E., Christoffersen, K.S., Convey, P., de Smet, W., Dózsa-Farkas, K., Ekrem, T., Fjellberg, A., Füreder, L., Gillespie, M.A.K., Gustafsson, D., Gwiazdowicz, D.J., Kaczmarek, Ł., Kolicka, M., Laniecki, R., Moerman, T.M., Seniczak, S., Seniczak, A., Simon, J.-C., Stur, E., Søli, G., Wieczorek, K., Zawierucha, K. & Zmudczynska-Skarbek, K. 2024a. Inventory of the terrestrial and freshwater fauna of the Svalbard archipelago. Version 1.4. The University Centre in Svalbard. Checklist dataset https://doi.org/10.15468/mfcetc accessed via GBIF.org on 2025-04-10.

Coulson, S.J., Bartlett, J., Boström, S., Brittain, J.E., Christoffersen, K.S., Convey, P., de Smet, W., Dózsa-Farkas, K., Ekrem, T., Fjellberg, A., Füreder, L., Gillespie, M.A.K., Gustafsson, D., Gwiazdowicz, D.J., Kaczmarek, Ł., Kolicka, M., Laniecki, R., Moerman, T.M., Seniczak, S., Seniczak, A., Simon, J.-C., Stur, E., Søli, G., Wieczorek, K., Zawierucha, K. & Zmudczynska-Skarbek, K. 2024b. On the terrestrial and freshwater invertebrate diversity of the High Arctic archipelago of Svalbard: a revised species inventory and synopsis of the community composition. *Arctic Science* 28(1), 1–16.

Dalenius, P. 1950. The oribatid fauna of South Sweden with remarks concerning its ecology and zoogeography. *Kungliga Fysiografiska Sällskapets i Lund Förhandlingar* 20(3), 30–48.

Elven, R. & Johansen, V. 1983. *Havstrand i Finnmark: flora, vegetasjon og botaniske verneverdier: rapport*. 357 pp. Universitetet, Tromsø.

Ermilov, S.G. & Makarova, O.L. 2021. Contribution to the knowledge of the oribatid mite genus *Scutozetes* (Acari, Oribatida, Tegoribatidae), with description of a new species from the Russian Arctic. *International Journal of Acarology* 47(6), 500–509.

Ermilov, S.G., Makarova, O.L. & Bizin, M.S. 2019. Morphological development, distribution and ecology of the arctic oribatid mite *Hermannia scabra* (Acari: Oribatida: Hermanniidae) and synonymy of *Hermannia gigantea*. *Zootaxa* 4717(1), 104–136.

GeoSvalbard 2025. https://geokart.npolar.no/geologi/GeoSvalbard/#11/78.8457/11.7460 (accessed January 2025).

Gjelstrup, P. & Solhøy, T. 1994. *The Zoology of Iceland: Oribatid mites (Acari)*. 78 pp. Steenstrupia, Zoological Museum of Copenhagen 3(57), Copenhagen.

Hammer, M. 1972. Microhabitats of oribatid mites on a Danish woodland floor. *Pedobiologia* 12(5/6), 412–423.

Hodkinson, I. 2013. Terrestrial and freshwater invertebrates. Pp. 247–275 in Meltofte, H. (Ed.), Arctic Biodiversity Assessment, CAFF, Akureyri.

Huhta, V. 2016. Catalogue of the Mesostigmata mites in Finland. *Memoranda Societatis pro Fauna et Flora Fennica* 92(1), 129–148.

Karppinen, E. 1971. Studies on the Oribatei (Acari) of Norway. *Annales Entomologici Fennici* 37(1), 30–53.

Kohyt, J. & Skubała, P. 2020. Oribatid mite (Acari: Oribatida) communities reveal the negative impact of the red oak (*Quercus rubra* L.) on soil fauna in Polish commercial forests. *Pedobiologia* 79, 150594, online 9 pp.

Leonov, V.D. & Rakhleeva, A.A. 2020. The first report on oribatid mites in tundra belts of the Lovozersky Mountains on the Kola Peninsula, Russia. *Acarologia* 60(2), 301–316.

Lewinsohn, T.M. & Jorge, R.L. 2024. *Species Diversity: Overview*. Pp. 275-286 in Scheiner, S.M. (Ed.), Encyclopedia of Biodiversity, Third Edition. Academic Press.

Lundqvist, L. 1987. Bibliografi och checklist over Sveriges oribatider (Acari: Oribatei). *Entomologisk Tidskrift* 108(1), 3–12.

Markkula, I. 2014. Permafrost dynamics structure species compositions of oribatid mite (Acari: Oribatida) communities in sub-Arctic palsa mires. *Polar Research* 33(1), 22926.

Mehl, R. 1979. Checklist of Norwegian ticks and mites (Acari). *Fauna Norvegica Seria* B 26, 31–45.

Miko, L. 2008. Revised list of oribatid mites (Acarina, Oribatida) of Slanské Vrchy Mountains, Eastern Slovakia. *Entomofauna carpathica* 20(1), 36–46.

Moen, A. 1998. Nasjonalatlas for Norge: Vegetasjon. Statens kartverk, Hønefoss.

Niedbała, W. & Liu, D. 2018. Catalogue of ptyctimous mites (Acari, Oribatida) of the world. *Zootaxa* 4393(1), 1–238.

Niemi, R. 1995. Oribatid species (Acari, Oribatida) new to the fauna of Finland. *Entomologici Fennici* 5(4), 213–217.

Niemi, R., Karppinen, E. & Uusitalo, M. 1997. Catalogue of the Oribatida (Acari) of Finland. *Acta Zoologica Fennica* 207(1), 1–39.

Norgeskart 2025. https://www.norgeskart.no (accessed March 2025).

Norton, R.A. & Ermilov, S.G. 2014. Catalogue and historical overview of juvenile instars of oribatid mites (Acari: Oribatida). *Zootaxa*, 3833(1), 1–132.

Norton, R.A. & Ermilov, S.G. 2024. Catalogue

of juvenile instars of oribatid mites (Acari: Oribatida)—The next decade (2014–2023). *Zootaxa* 5419(4), 451–494.

Norsk Polarinstitutt 2025. https://toposvalbard.npolar.no (accessed March 2025).

OpenStreetMap Foundation 2025. https://www.openstreetmap.org (accessed March 2025).

Olszanowski, Z., Rajski, A., Niedbała, W. 1996. *Roztocze. Acari; Mechowce Oribatida*. *Katalog Fauny Polski*. 243 pp. Sorus, Poznań.

Rymer, K.G. & Wachecka-Kotkowska, L. 2024. Sources of the aeolian material in periglacial conditions based on quartz grain analysis. *Quaestiones Geographicae* 44(1), 17–29.

Schatz, H. 2020. Catalogue of oribatid mites (Acari: Oribatida) from Vorarlberg (Austria). *Zootaxa* 4783(1), 1–106.

Schatz, H., Behan-Pelletier, V.M., OConnor, B.M. & Norton, R.A. 2011. *Suborder Oribatida van der Hammen, 1968*. Pp. 141–148 in Zhang, Z.-Q. (Ed.), Animal Biodiversity: An Outline of Higher-Level Classification and Survey of Taxonomic Richness. Magnolia Press: Auckland, New Zealand.

Seniczak, A. & Seniczak, S. 2020. Diversity of oribatid mites (Acari: Oribatida) in the Svalbard archipelago: a historical overview. *Zootaxa* 4834(1), 41–65.

Seniczak, A., Bolger, T., Roth, S., Seniczak, S., Djursvoll, P. & Jordal, B.H. 2019. Diverse mite communities (Acari: Oribatida, Mesostigmata) from a broadleaf forest in western Norway. *Annales Zoologici Fennici* 56(1), 121–136.

Seniczak, A., Niedbała, W., Iturrondobeitia, J.C., Seniczak, S., Roth, S. & Jordal, B.H. 2021a. Type of broadleaf forest matters most for ptyctimous mite communities (Acari, Oribatida) in Norway. *Biodiversity and Conservation* 30(1), 2929–2953.

Seniczak, A., Seniczak, S., Graczyk, R., Kaczmarek, S., Jordal, B.H., Kowalski, J., Djursvoll, P., Roth, S. & Bolger, T. 2021b. A forest pool as a habitat island for mites in a limestone forest in southern Norway. *Diversity* 13(11), 578.

Seniczak, A., Seniczak, S., Hagen, S.B. & Klütsch, C.F.C. 2023a. A new species *Zachvatkinibates svanhovdi* sp. nov. (Acari: Oribatida: Punctoribatidae) from Norway with comments on Punctoribatidae in Fennoscandia. *Acarologia* 63(1), 41–57.

Seniczak, A., Seniczak, S., Hagen, S.B. & Klütsch C.F.C. 2023b. Morphological ontogeny of *Nanhermannia sellnicki* (Acari, Oribatida, Nanhermanniidae), and comments on *Nanhermannia* Berlese. *Zootaxa* 5324(1), 110–132.

Seniczak, A., Seniczak, S., Hagen, S.B., Klütsch, C.F.C. 2023c. Morphological ontogeny of *Zachvatkinibates svanhovdi* (Acari, Oribatida, Punctoribatidae). *Zootaxa* 5324(1), 66–82.

Seniczak, A., Seniczak, S., Iturrondobeitia, J.C., Solhøy, T. & Flatberg, K.I. 2020a. Diverse *Sphagnum* mosses support rich moss mite communities (Acari, Oribatida) in mires of western Norway. *Wetlands* 40, 1339–1351.

Seniczak, A., Seniczak, S., Schwarzfeld, M.D., Coulson, S.J. & Gwiazdowicz, D.J. 2020b. Diversity and distribution of mites (Acari: Ixodida, Mesostigmata, Trombidiformes, Sarcoptiformes) in the Svalbard Archipelago. *Diversity* 12(9), 323, online, 31 pp.

Seniczak, A., Seniczak, S., Starý, J., Kaczmarek, S., Jordal, B.H., Kowalski, J., Roth, S., Djursvoll, P. & Bolger T. 2021c. High diversity of mites (Acari: Oribatida, Mesostigmata) supports the high conservation value of a broadleaf forest in eastern Norway. *Forests* 12(8), 1098.

Seniczak, S., Seniczak, A., Graczyk, R., Tømmervik, H. & Coulson, S.J. 2017. Distribution and population characteristics of the soil mites *Diapterobates notatus* and *Svalbardia paludicola* (Acari: Oribatida: Ceratozetidae) in High Arctic Svalbard (Norway). *Polar Biology* 40(1), 1545–1555.

Subías, L.S. (2004, updated 2024) Listado sistemático, sinonímico y biogeográfico de los Ácaros Oribátidos (Acariformes, Oribatida) del mundo (1758–2002). *Graellsia*, 60 (número extraordinario), 3–305. Updated in 2024 (540 pp.), access 01.08.2024. doi.org/10.3989/graellsia.2004.v60.iextra.218

Thor, S. 1937. Übersicht der norwegischen Cryptostigmata mit einzelnen Nebenbemerkungen. *Nyt Magazin for Naturvidenskaberne* 77(1), 275–307.

Weather and Climate 2025, https://weatherandclimate.com/norway/finnmark/nyrud (accessed January 2025).

Weigmann, G. 2006. *Hornmilben (Oribatida)*. Pp. 1–520 in Dahl, F. (Ed.), Die Tierwelt Deutschlands part 76. Goecke & Evers, Keltern.

Weigmann, G., Horak, F., Franke, K. & Christian, A. 2015. Verbreitung und Ökologie der Hornmilben (Oribatida) in Deutschland. *Senckenberg, Museum Für Naturkunde, Görlitz, Peckiana* 10, 1–171.

Received: 12 March 2025
Accepted: 6 April 2025